

Attachment C: Possible ITR Technology Diversity Provision Concepts

Possible Eligibility Criteria:

- 1) The technology is an engine, microturbine, or other heavy-duty vehicle propulsion technology that reduces oxide of nitrogen (NO_x) or carbon dioxide (CO₂) emissions, as determined by the Executive Officer (EO) based upon his or her engineering judgement, emission testing, evaluation of peer reviewed literature, inclusion of the technology as a California State Implementation Plan section 182(e)(5) “black box” advanced technology strategy, selection of the technology to receive public funding from California Air Resources Board (ARB) or other California or federal public agency based upon its NO_x or CO₂ emission reduction efficacy, and other relevant data and information.
- 2) The technology has not been certified for use in a medium- or heavy-duty vehicle prior to the 2016 model year (MY).
- 3) The technology presents a significant certification or on-board diagnostics (OBD) compliance challenge to the manufacturer.
- 4) *Staff welcomes stakeholder feedback regarding potential eligibility criteria for a promising suite of engine technologies that might not individually be defined as innovative, as well as for significant advancements to an existing engine technology.*

Possible Implementation Process

The manufacturer must apply each MY to the ARB EO for certification flexibility under one of two possible certification flexibility pathways, depending upon whether the technology reflects a fundamentally *new engine technology platform* or represents a modification of an *existing engine platform*. The pathway for which a technology is eligible would be based upon the EO’s evaluation of the level of technology advancement from existing, ARB-certified engine technologies, and the resulting certification and OBD compliance challenge.

Possible Existing Engine Technology Platform.

Potential technology based upon an existing engine platform, such as: advanced engine transmission, engine downsizing, engine downspeaking, innovative fuel injection technology, advanced waste heat recovery, cylinder deactivation, engine stop-start technology, and predictive cruise technology.

A technology based upon an existing engine platform could be eligible for:

- One MY of the ITR Tier 1 flexibility similar to that afforded low NO_x engines, maximum 200 engines per manufacturer, and;
- One MY of the ITR Tier 2 flexibility similar to that afforded low NO_x engines, maximum 200 engines per manufacturer.

Possible New Engine Technology Platform.

Potential technology based upon a new engine platform, such as: opposition piston engine, free piston engine, camless engine, microturbine.

A technology based upon a new engine platform could be eligible for:

- Two MYs of EMD+ rather than full OBD, maximum of 100 engines per manufacturer in each MY, and;
- Two MYs of ITR Tier 2 flexibility similar to that afforded heavy-duty hybrid engines, maximum of 200 engines per manufacturer in each MY.

Possible Sunset Provisions: As with ITR provisions for hybrids and low NO_x engines, the technology diversity provisions could sunset for each engine technology four MYs after two engine families utilizing the innovative technology from any manufacturer have been ARB-certified (i.e, four MYs after technology launch). An engine technology that is first ARB-certified five MYs after technology launch should be ineligible for the technology diversity provisions.